TEMIC

TELEFUNKEN Semiconductors

TDA 1083

Monolithic Integrated Circuit

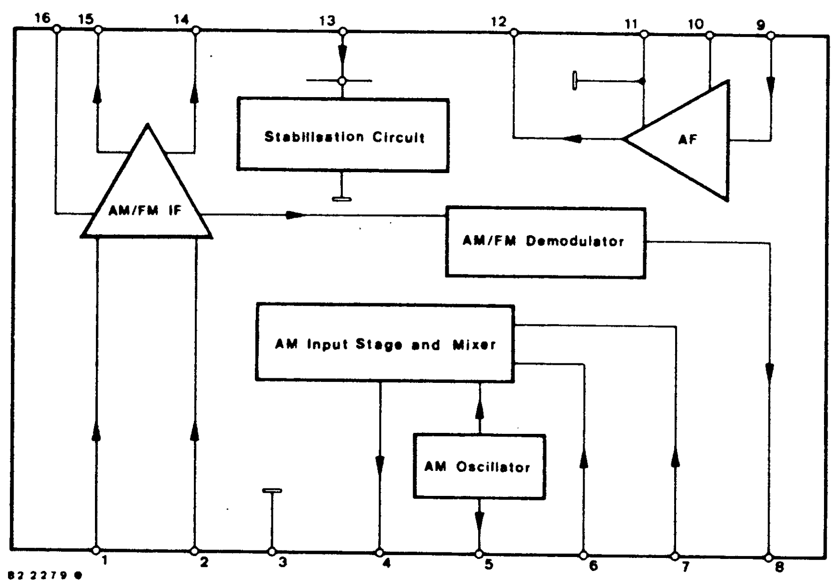
Description

The integrated circuit TDA 1083 includes, with exception of the FM front end, a complete AM–/FM–radio–circuit with audio power amplifier. An internal Z–diode stabilizes the supply voltage at $V_S \approx 13V$, which allows with the aid of a resistor and a rectifier, the circuit to be driven by a higher external supply voltage.

Applications: AM–/FM– and Audio–Amplifier

Features

- Large supply voltage range V_S=3 ... 12V
- High AM–Sensitivity
- Limiting threshold voltage V_i=50 µV
- Audio output power P_0= 0.7 W
- AFC–connection for VHF–Tuner
- AM–FM switching without high frequency voltages



1 IF-Decoupling
2 IF-Input
3 HF-Ground
4 AM-Mixer output
5 AM-Oscillator circuit
6 AM-Input
7 AM-Decoupling
8 Demodulator-Output
9 Audio-Input
10 Audio-Feedback
11 Audio-Ground
12 Audio-Output
13 + V_S
14 Demodulator circuit
15 Demodulator circuit
16 AGC/AFC-Voltage

Figure 1 Block diagram and pin connections

Absolute Maximum Ratings

Reference points Pin 3 and 11, unless otherwise specified

Parameters	Symbol	Value	Unit
Supply voltage range Pin 13	V_s	3 ... 12	V
Supply current when using the integrated stabilisation circuit, V_S=12.5 to 14.3V Pin 13	I_S	50	mA
Power dissipation T_{amb}=65 °C	P_{tot}	600	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	–25 ... +125	°C

Thermal Resistance

Parameters	Symbol	Maximum	Unit
Junction ambient	R_{thJA}	100	K/W

Electrical Characteristics

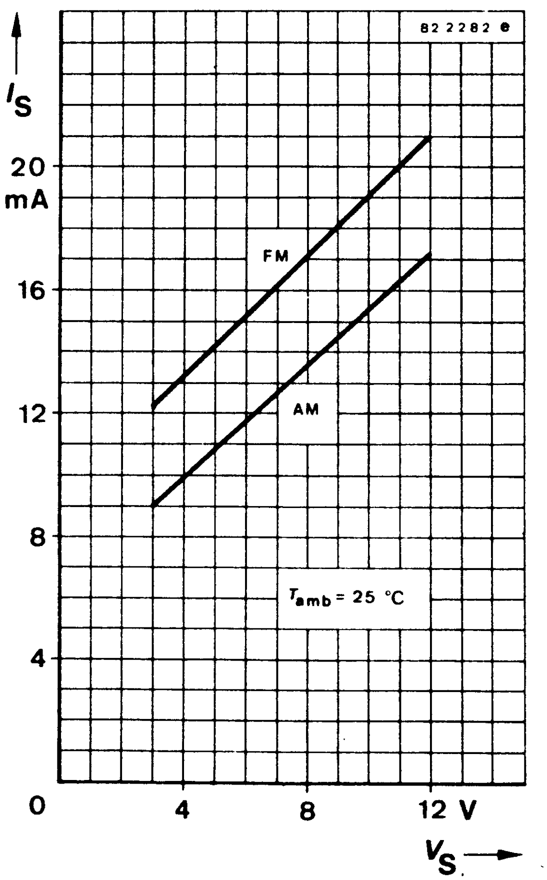
V_S= 9 V, reference points Pin 3 and 11, T_{amb}= 25 °C, unless otherwise specified

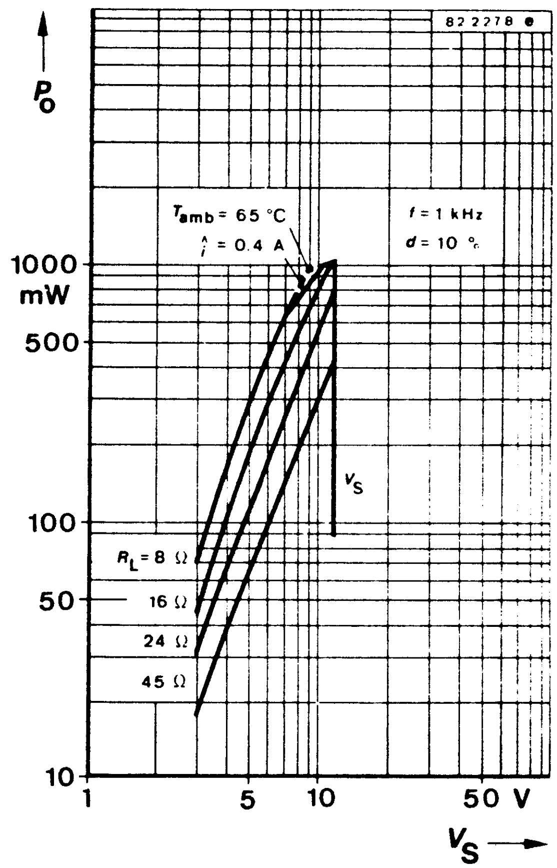
Parameters	Test Conditions / Pin	Symbol	Min	Typ	Max	Unit
AF Amplifier						
AF voltage amplification	f= 1 kHz	G_v		40		dB
Input impedance		R_i		150		kΩ
Output power	Figure 4, 5 V_S=5.5V, R_L= 8Ω,= 10%	P_o	300			mW
AM-IF Amplifier, f_i=1MHz, f_{IF}=455kHz, f_{mod}=1kHz, m=0.3						
DC voltages at AM mode without signal at: V_S=3V	Pin 10 Pin 12 Pin 13 Pin 16	V_{10B} V_{12B} V_{13B} V_{16B}	 1.0 3.0 1.25	1.2 3.0 	 1.4 3.0 2.0	V V V V
I_S=42 mA (V_S =12.5...14.3 V)	Pin 10 Pin 12 Pin 13 Pin 16	V_{10B} V_{12B} V_{13B} V_{16B}	 5.9 12.5 1.5	1.2 13.3 	 7.2 14.3 2.0	V V V V
Regulation range for: V_{oAF}/V_{oAF} = –10dB	Pin 6	ΔV_i		70		dB
AF voltage at demodulator output	Pin 8	V_{oAF}		100		mV
FM-IF Amplifier, f_{IF}=10.7 MHz, Δf = ± 22,5 kHz, f_{mod}=1 kHz						
DC voltages at FM mode without signal at: V_S=3V	Pin 10 Pin 12 Pin 13 Pin 16	V_{10B} V_{12B} V_{13B} V_{16B}	 1.0 3.0 1.8	1.2 3.0 	 1.4 3.0 2.8	V V V V
I_S=42 mA (V_S =12.5...14.3 V)	Pin 10 Pin 12 Pin 13 Pin 16	V_{10B} V_{12B} V_{13B} V_{16B}	 5.9 12.5 2.0	1.2 13.3 	 7.2 14.3 3.1	V V V V
Limiting threshold (–3 dB)	Pin 2	V_i		50		µV
AF voltage at demodulator output	Pin 8	V_{oAF}		100		mV

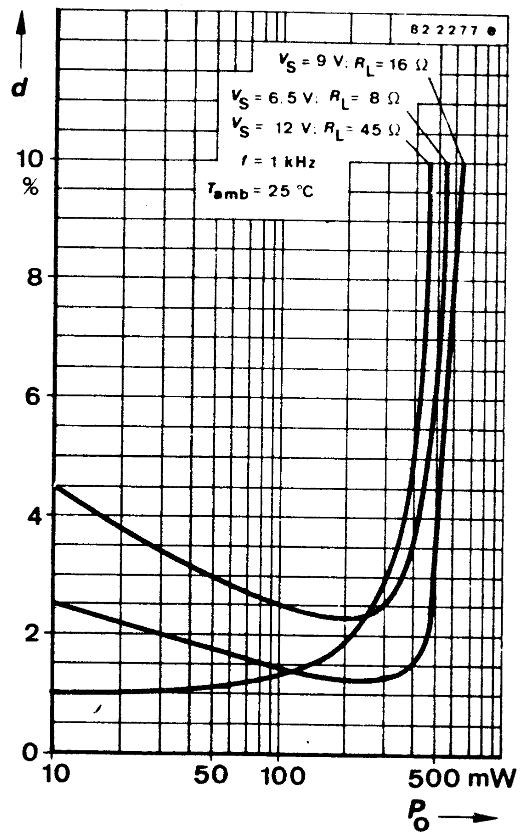
Different dc voltages are developed at Pin 16 due to gain spread of AM–IF–amplifier. To determine the value of parallel resistance R_8, at the output of the demodulator Pin 8 for V_S = 9 V, AM mode without signal, dc voltage should be selected at Pin 16.

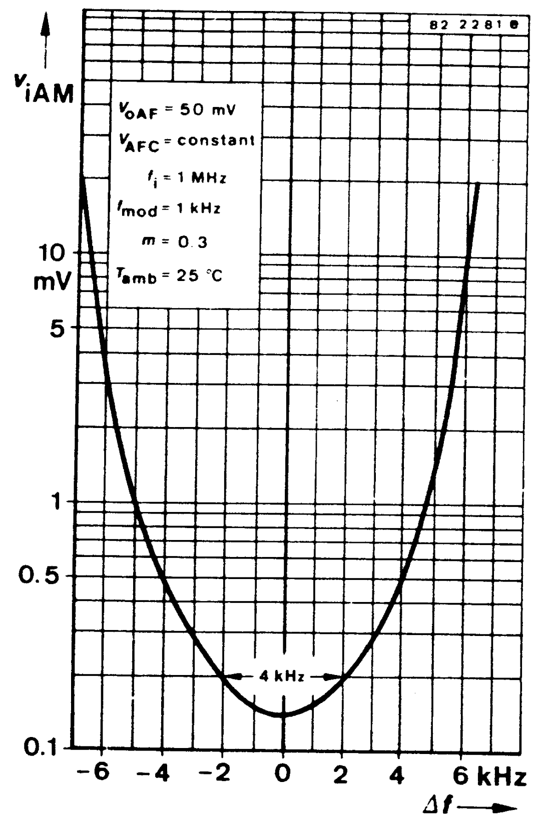
Available in following voltage groups:

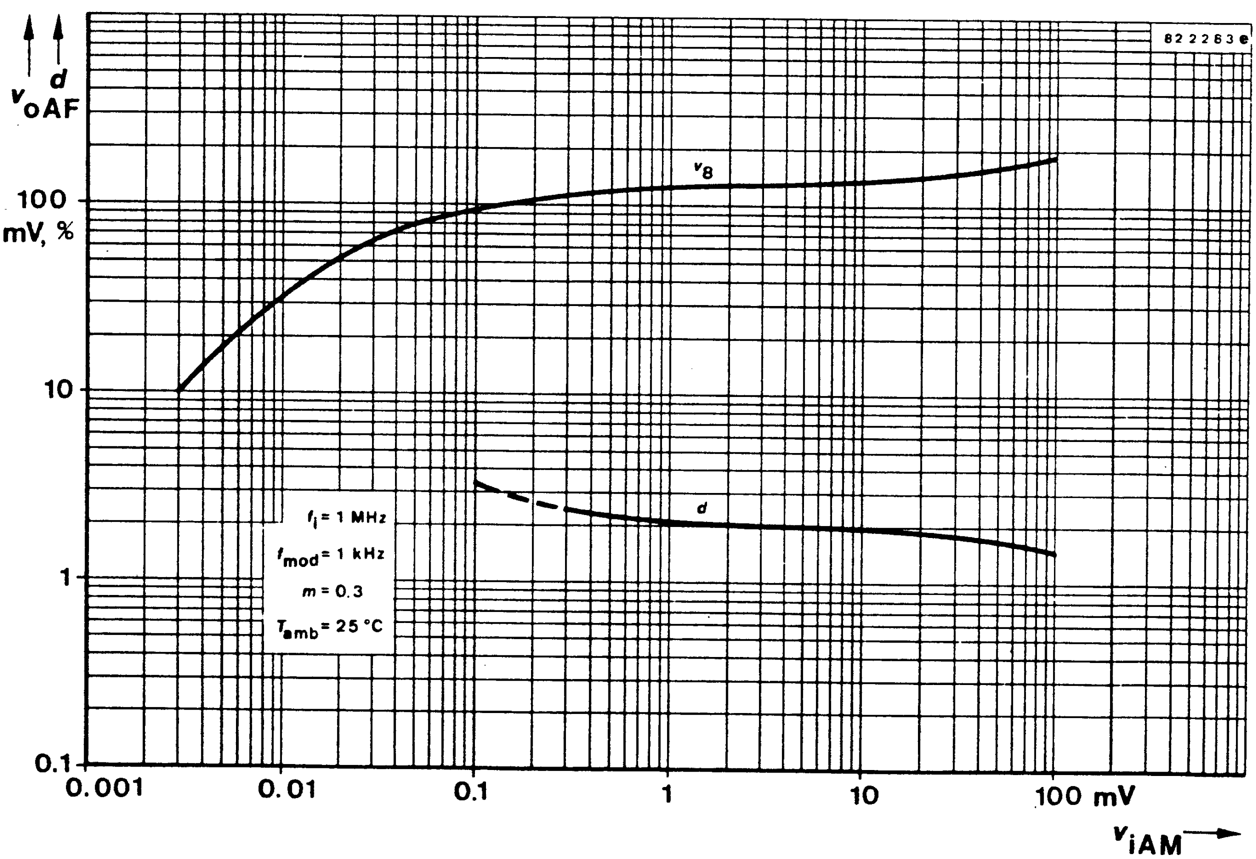
V_{16}	1.4 ... 1.7 V	1.7 ... 1.9 V	1.9 ... 2.1 V
R_8	∞	47 kΩ	33 kΩ
Group	1	2	3

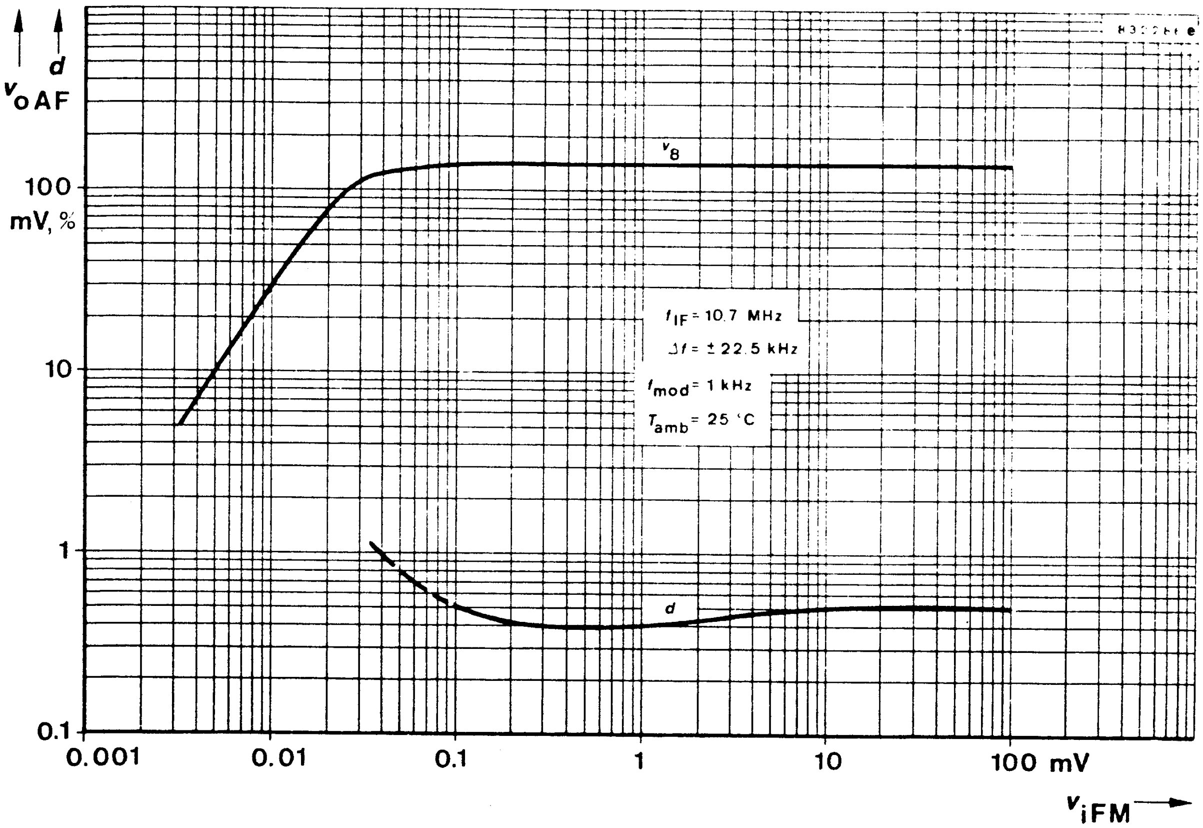


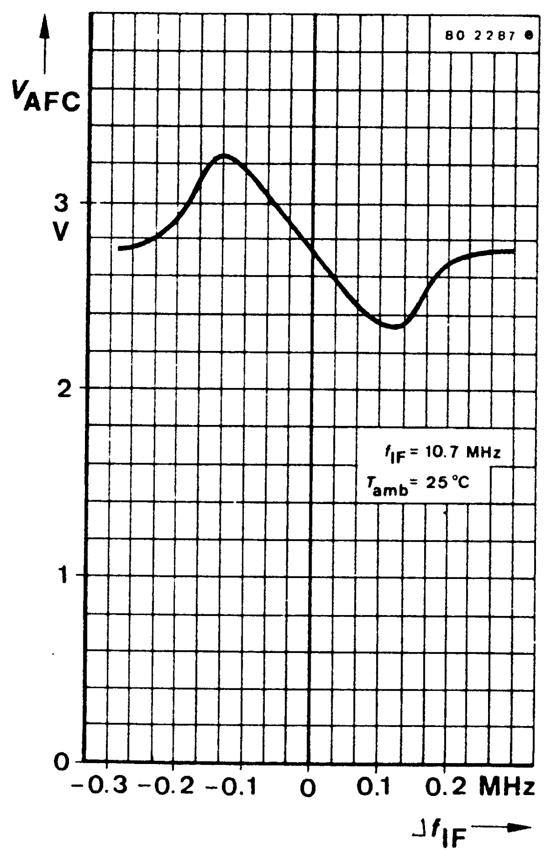



82 2277 e
d
10 %
8
6
4
2
0
10
50
100
500 mW
P_o
V_S = 9 V; R_L = 16 Ω
V_S = 6.5 V; R_L = 8 Ω
V_S = 12 V; R_L = 45 Ω
f = 1 kHz
T_{amb} = 25 °C


82 2281 e
v_{iAM}
10 mV
5
1
0.5
0.1
−6
−4
−2
0
2
4
6 kHz
Δf
v_{oAF} = 50 mV
V_{AFC} = constant
f_i = 1 MHz
f_{mod} = 1 kHz
m = 0.3
T_{amb} = 25 °C
4 kHz


82 2283 e
v_{oAF}
d
100 mV, %
10
1
0.1
0.001
0.01
0.1
1
10
100 mV
v_{iAM}
v_8
d
f_i = 1 MHz
f_{mod} = 1 kHz
m = 0.3
T_{amb} = 25 °C


d
v_{oAF}
100
mV, %
10
1
0.1
v_8
d
f_{IF} = 10.7 MHz
Δf = ± 22.5 kHz
f_{mod} = 1 kHz
T_{amb} = 25 °C
0.001
0.01
0.1
1
10
100 mV
v_{iFM}


80 2287 e
V_{AFC}
3
V
2
1
0
f_{IF} = 10.7 MHz
T_{amb} = 25 °C
−0.3
−0.2
−0.1
0
0.1
0.2 MHz
$Δf_{IF}$

Components in Figure 9

L_1	=	4	Wdg ∅ 0.45 CuL, Threaded core 7.5x3 material: Fi 01 U8 (Vogt GmbH)
L_2	=	5	Wdg ∅ 0.45 CuL
L_3	=	5	Wdg ∅ 0.45 CuL, air core ∅ 3.5 mm
L_4	=	3+3	Wdg ∅ 0.45 CuL, air core ∅ 2.7 mm
L_5	=	12	Wdg ∅ 0.25 CuL, Pin 3–1, Filter kit 154 AN(C) or 154ANS–7 A6363A0 (TOKO, Componex)
L_6	=	2	Wdg ∅ 0.25 CuL, Pin 4–6
L_7	=	7	Wdg ∅ 0.25 CuL, Pin 6–3, Filter kit 154AN(C) or 154EES–7 A6392FA (TOKO, Componex)
L_8	=	7	Wdg ∅ 0.16 CuL, Pin 1–4, Filter kit 154AN(C) or 154EES–7 A6391ABM (TOKO, Componex)
L_9	=	5	Wdg ∅ 0.16 CuL, Pin 2–6
L_{10}	=	96	Wdg ∅ 0.25 CuLs, Ferrite aerial ∅ 8x130 mm, Type 031039–2103–606, (Draloric)
L_{11}	=	6	Wdg ∅ 0.25 CuLs
L_{12}	=	78	Wdg ∅ 0.09 CuL, Pin 3–4, Filter kit RBR or RWOS–6A7609AAU (TOKO, Componex)
L_{13}	=	7	Wdg ∅ 0.09 CuL, Pin 2–1
L_{14}	=	18	Wdg ∅ 0.09 CuL, Pin 3–4, Filter kit RHN(C) or RHCS–1A7607AQH (TOKO, Componex)
L_{15}	=	46+100	Wdg ∅ 0.09 CuL, Pin 6–2–1
L_{16}	=	72+72	Wdg ∅ 0.09 Cul Pin 3–4/6–1, Filter kit RHN(C) or RHNS–1A7608AZP (TOKO, Componex)
455 kHz	=	Ceramic filter LBF 6 (Componex) or CFU 445 H (Stettner)	
10.7 MHz	=	Ceramic filter 10.7 MF–18 (Componex) or SFE 10.7 MA (Stettner)	
D_{r1}, D_{r3}	=	Ferrit bead on the transistor terminal	
D_{r2}	=	16	Wdg ∅ 0.25 CuL, ∅ 2 air core
D_{r4}	=	6	Wdg ∅ 0.15 CuL, ∅ 2.1x3 mm Ferrit bead
C_6=C_{14}	=	4.5 ... 20 pF, Variable capacitor Type CY2–22124–RT02 (TOKO, Componex)	
C_{19}	=	5 ... 80 pF	
C_{21}	=	5 ... 140 pF	
R_8	=	according to gain groups ∞, 47 kΩ or 33 kΩ	

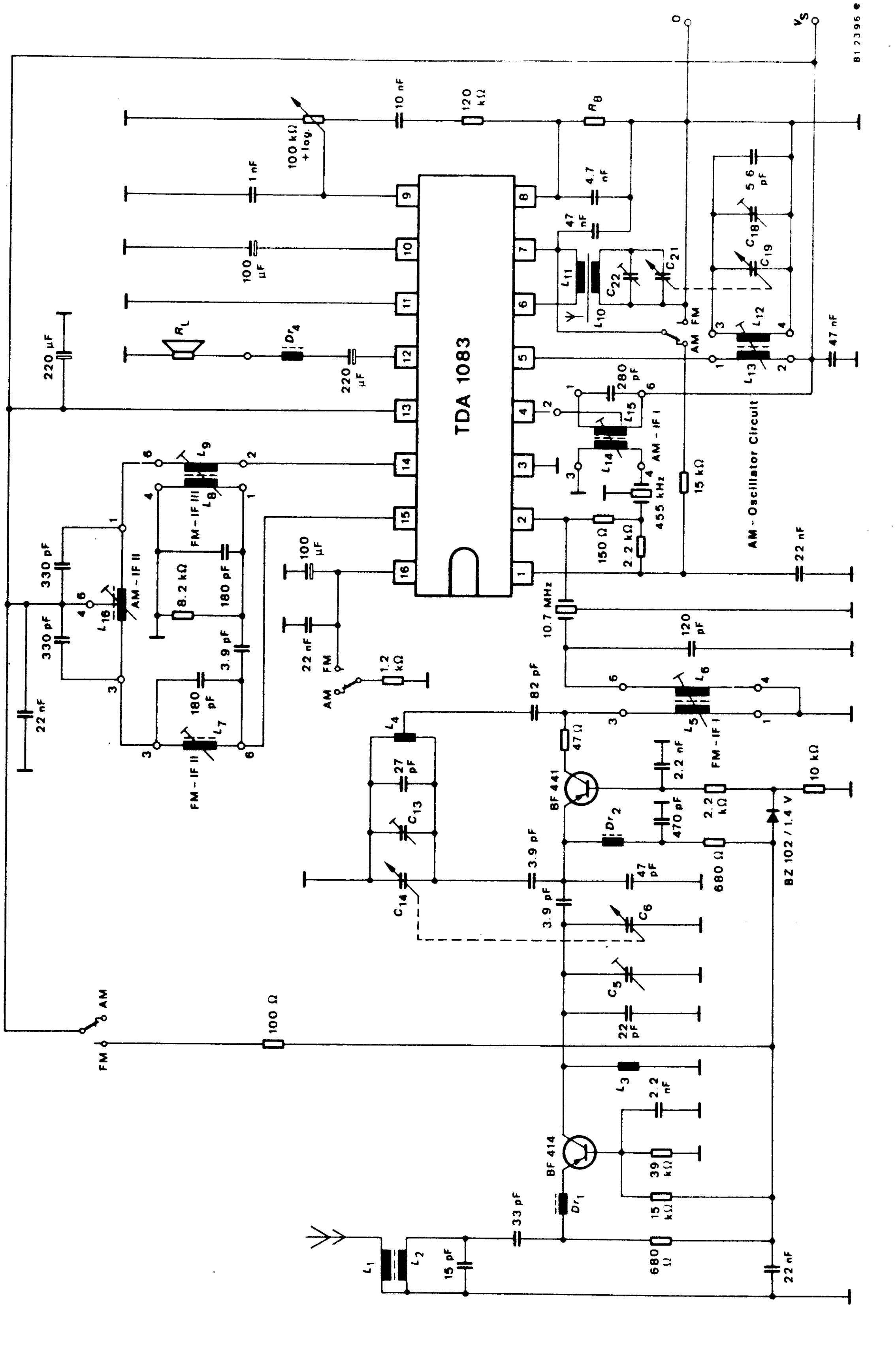


Figure 9 FM–/AM–receiver circuit

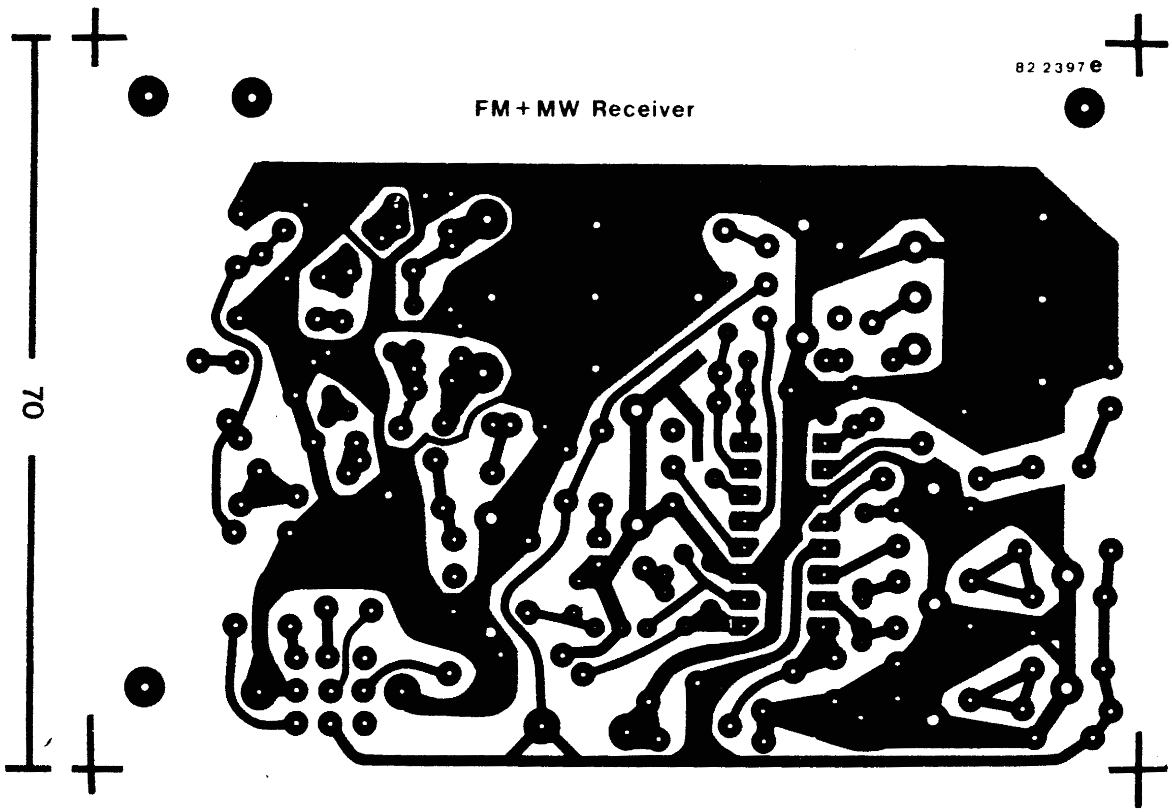


Figure 10 Layout of circuit board (soldered side) of the FM–/AM–receiver

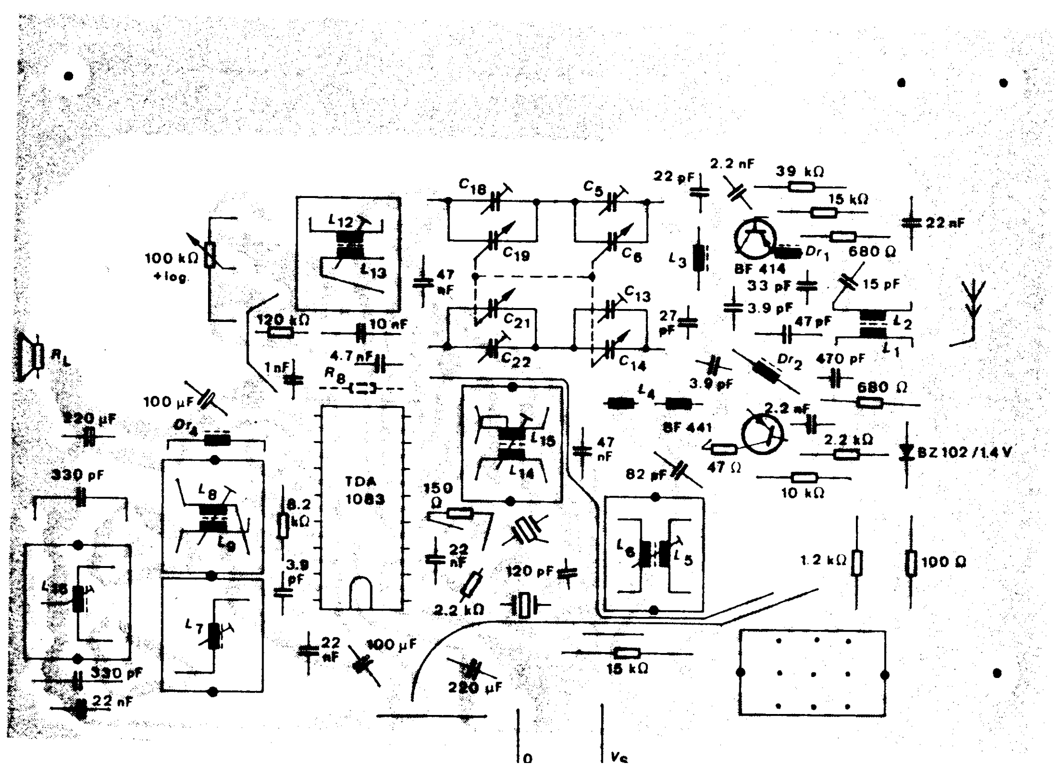
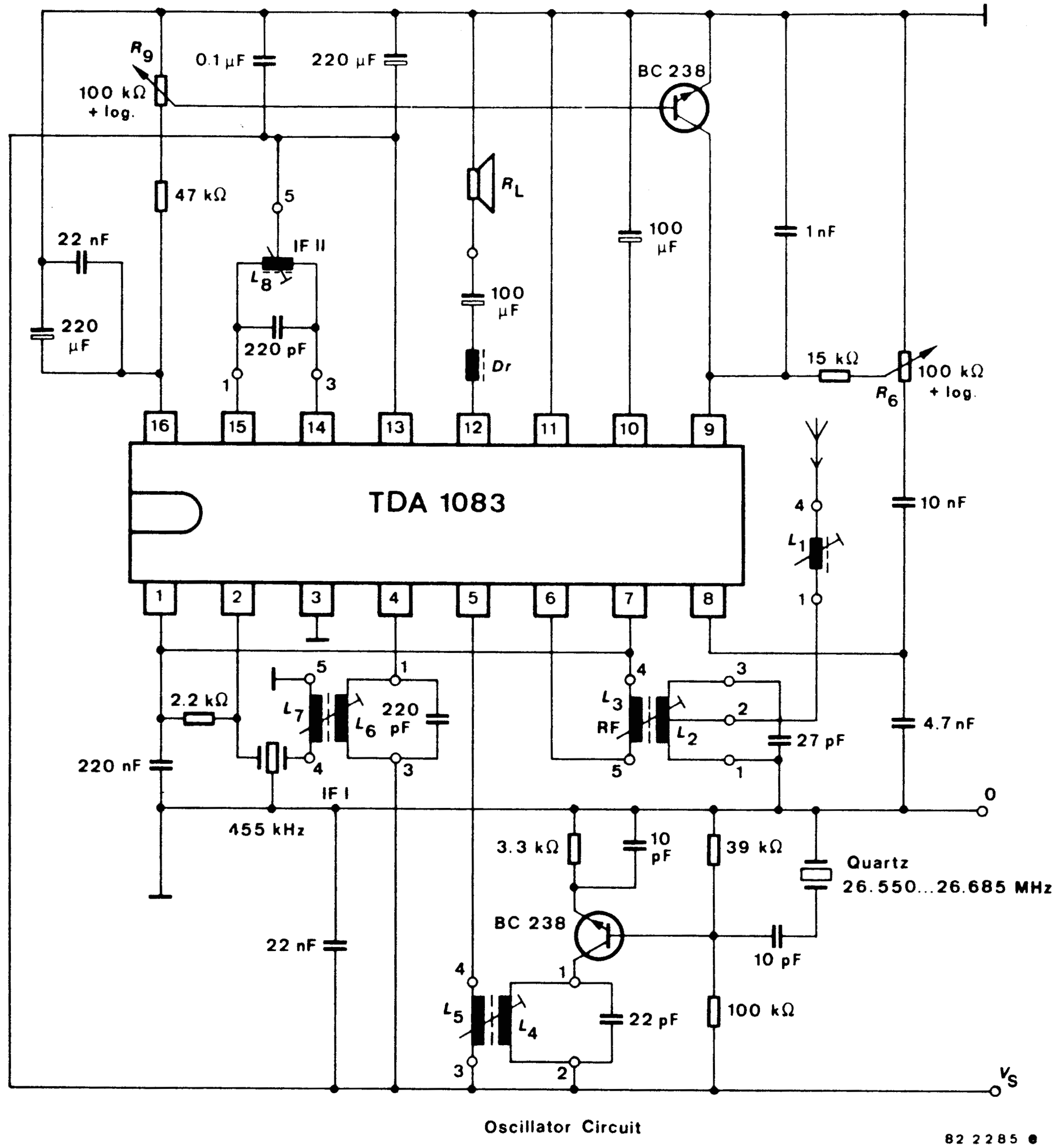


Figure 11 Printed board with components for FM–/AM–receiver



L_1	=	3	Wdg ∅ 0.25 CuL Pin 3–4 (Neosid 7F1)
L_2	=	3+4	Wdg ∅ 0.25 CuL Pin 1–2–3 (Neosid 7F1)
L_3	=	3	Wdg ∅ 0.25 CuL Pin 4–5
L_4	=	8	Wdg ∅ 0.45 CuL Pin 1–2 (Neosid 7F1)
L_5	=	1	Wdg ∅ 0.25 CuL Pin 3–4
L_6	=	154	Wdg ∅ 0.08 CuL Pin 1–3 (Neosid 7A1)

L_7	=	30	Wdg ∅ 0.08 CuL Pin 4–5
L_8	=	76+76	Wdg ∅ 0.08 CuL Pin 1–5–3 (Neosid 7A1)
D_r	=	4	Wdg ∅ 0.25 CuL Ferrit bead
455 kHz	=	Ceramic filter LFB 6 (Componex) or CFU 455 H (Stettner)	
R_6	=	Volume control	
R_9	=	Squelch	

Figure 12 27 MHz–receiver circuit

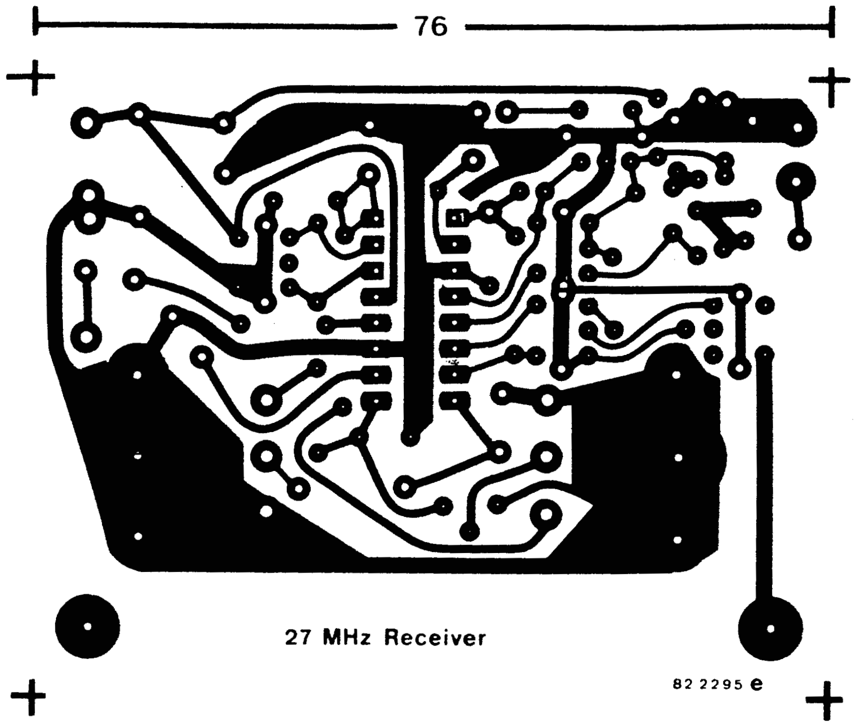


Figure 13 Layout of circuit board (soldered side) for 27 MHz–receiver

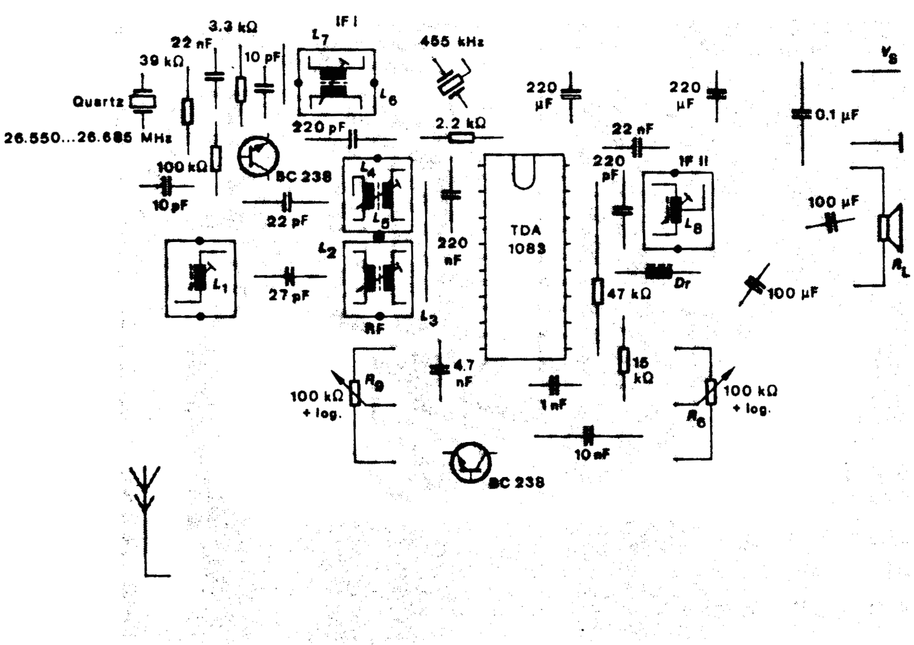
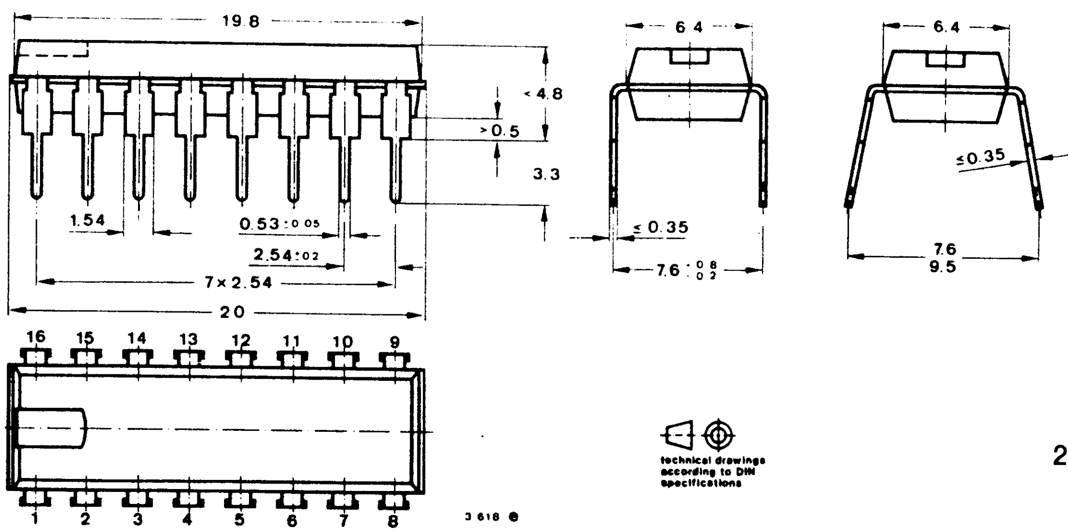


Figure 14 Printed board with components for 27 MHz–receiver

Dimensions in mm



Case
20 A 16 DIN 41866
JEDEC MO 001

OZONE DEPLETING SUBSTANCES POLICY STATEMENT

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements and

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

Of particular concern is the control or elimination of releases into the atmosphere of those substances which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) will soon severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division has been able to use its policy of continuous improvements to eliminate the use of any ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA and

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

TEMIC can certify that our semiconductors are not manufactured with and do not contain ozone depleting substances.

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